Notes

LEVELSYSTEM

English - Electronic Levelling System

User Manual

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Preface

Products must be 100% user friendly and reliable. This is the strategic vision at E&P Hydraulics, the designer of this levelling system. By purchasing this product you will be permanently relieved from the trouble of levelling the camper. No longer a camper that moves when you walk through it or when the wind blows hard, no more doors that open or shut due to differences in height, no more shower water running the wrong way, and never more the feeling that you are sleeping in a sloping bed. With just one press of a button, your camper will from now on be levelled fully automatically. Rock-solid, in less than two minutes.

It is not difficult to operate the E&P Levelling System. It is a lightweight, compact as well as extremely solid product that is virtually maintenance free. The production is based on quite a few test hours. And, if in spite of this, faults start to appear in the future, you will always be able to rely on the warranty and service of E&P Hydraulics. However, no matter how easy to operate, extremely solid and maintenance friendly our levelling system is, you will always need a user manual. We do not only find it important to show your the features of this product, but also what you cannot do with it. Therefore, please carefully read this user manual prior to putting the system in operation. Just like any other system, the E&P Levelling System has its limitations as well, and it is very important that you are aware of them. When (partly) lifting campers, great forces are being used, and these must be used carefully and skilfully. Safety first.

If you observe the warnings and recommendations in this user manual, you will enjoy using our product for many years.
On behalf of E&P Hydraulics

Eric Klinkenberg & Pierre Blom

The system

E&P's electronic levelling system is an electrically/hydraulically driven system. A hydraulic pump is powered by a 12V direct current motor, which will lead fl uid through a system of pipes, control devices and jacks, so that the camper can be levelled and stabilized.

E&P's jacks have the bearing capacity that your camper requires. Each jack has a 228 mm diameter fl oor plate on a ball pivot guaranteeing the greatest firmness possible on any surface. The jacks are controlled by a central 12V direct current motor/pump unit. It contains the oil tank, control valve distributor and solenoids. E&P's levelling system is electronically controlled. It can be operated semi-manual or fully automatic. The customer can freely choose the location of the switching panel. The levelling system of E&P is fully integrated in the undercarriage of the camper.

Using the system

- Park the camper on a surface that is as level as possible.
- The HAND BRAKE of the camper must be engaged.
- The transmission must be in a neutral position or in the parking position.
- When the levelling system is operating, persons or animals are not allowed in the camper.
- The ignition of the vehicle must be switched on.

Features and operation

- Automatically extending the jacks from a retracted position.
- Automatically or manually levelling the jacks.
- Automatically retracting the jacks.
- Alarm mode (jacks not retracted and hand brake disengaged).
- Automatic error message jacks and error mode.
- Configuration function for levelling zero point.

Warnings

Not observing the following warnings may lead to damages to the camper and/or serious injuries.

!! Using the E&P levelling system for other purposes than supporting campers is officially forbidden according to E&P Hydraulic's limited warranty. This product is exclusively developed as a levelling system and may not be used for other work under the camper such as changing the tyres, maintenance or applying snow chains.

!! When the system is operating, all persons and animals should keep their distance.

!! Hands and other body parts should never come in contact with released fl uids. Oil leaving the levelling system may be under high pressure and could cause serious injuries to the skin.

!! Never fully lift the camper. If the tyres no longer reach the fl oor, this could lead to unstable and dangerous situations.

!! The camper should be parked on a solid, level and non-slippery surface. The parking location must be free of holes and free of waste and surrounding objects.

!! If the camper is parked on very soft soil, you must place a support plate under each jack in order to distribute the weight.

!! Check if the installation of the system is performed by a skilled mechanic with sufficient practical experience and technical training. As the installation requires a high level of skill. After all, we are dealing with equipment that is being integrated in the undercarriage, which will be submitted to great forces, forces that are often underrated by people with no technical training. At all times, mechanics will bear sole responsibility for the assembly of the system.

!! In case of repairs/malfunctions: know what you are doing. Never try to repair it yourself, but consult an expert.

!! Fully read this user manual, before using the levelling system.

Settings

Setting the zero point

Before automatic levelling can be activated, you must set the zero point. This is the point to which the system returns in an automatic cycle. For setting the zero point, you must first perform a manual levelling, so that the vehicle can be placed on the required level. Only then, you will be able to set the zero point. Do this by placing a spirit level in the car

Step 1 For activating this mode, you must follow the next sequence:
Step 2 Switch off the control panel. Switch on the control panel.
Step 3 Press the button FRONT (no. 12) five times.
Step 4 Press the button REAR (no. 11) five times.
Step 5 All LEDs will be flashing. You are now in the zero mode.
Step 6 Press button RETRACT ALL (no. 8) three times while in zero mode, in order to set the zero point. Wait 20 seconds, until the system has saved the zero point.

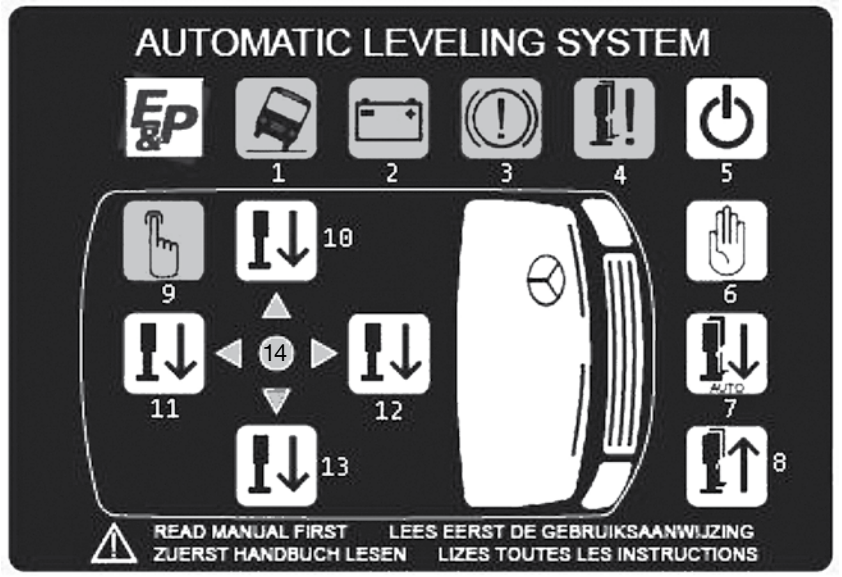
Programming air suspension mode (when installed)

First bring the vehicle in level position.
Switch off the control panel. Switch on the control panel.
- Press the button FRONT (no. 12) five times.
- Press the button REAR (no. 11) five times.
- All LEDs will be flashing.
- You are now in the zero mode.
- Press button RETRACT ALL (no. 8) three times
- Wait 2 seconds
- Press again button RETRACT ALL (no. 8) three times

Now the airsuspension mode is activated.
Switch of control panel.

Bedienteil

(1) LED message SLOPE TOO STRONG - In this position the camper cannot be levelled (the surface is not even enough). If necessary, switch over to manual mode.
(2) LED message LOW VOLTAGE - the battery is empty or the voltage is too low to be able to work safely.
(3) LED message ENGAGE HAND BRAKE - Message indicating that the hand brake is disengaged. When the hand brake is engaged again, the LED will go out.
(4) LED message JACKS NOT (fully) RETRACTED - One or more jacks are extended or not fully retracted.
(5) Button ON/OFF - switches the control panel on or off.
(6) Button MANUAL MODE - the switch panel is in manual mode.
(7) button AUTOMATIC MODE ON - indicates that the system is ready for automatic levelling of the camper.
(8) Button RETRACT ALL JACKS - automatically retracts all jacks.
(9) LED message MANUAL MODE - indicates that the camper can now be brought to the correct level manually.
(10) Button LEFT SIDE - controls retracting and extending the left jacks.
(11) Button REAR SIDE - controls retracting and extending the rear jacks.
(12) Button FRONT SIDE - controls retracting and extending the front jacks.
(13) Button RIGHT SIDE - controls retracting and extending the right jacks.
(14) LED message LEVEL - indicates that the camper is brought to the required level.



Bedienung Des Systems

Automatic levelling

- Make sure that the vehicle's hand brake is engaged and that the ignition is on.
- Press the ON/OFF switch (1 x on no. 5) on the switch panel. The LED with the E&P logo will light. If the hand brake is not engaged, ENGAGE HAND BRAKE (no. 3) will start to flash.
- Make sure that everybody has left the vehicle, including you. Now press button AUTO (no. 7) to start the automatic levelling procedure. Only enter the camper again when the green LED in the middle of the control panel lights.
- Press the ON/OFF switch (no. 5) to switch off the system.

Manual levelling

- Press the ON/OFF switch (1 x on no. 5) on the switch panel.
- Press button MANUAL (no. 6), until the LED lights.
- Press button FRONT (no. 12), until the jacks reach the floor (first bring the vehicle on level from front to rear).
- Press button REAR (no. 11), until the jacks reach the fl oor.
- Press button FRONT or REAR: press button FRONT if the arrow points towards the front of the camper; press button REAR if the arrow points towards the back. Keep pressing the button until it stops automatically (arrow is off).
- Press button LEFT (no. 10) or RIGHT (no. 13): if the arrow is on the left side of the camper, press button LEFT; if the arrow is on the right side of the camper, press button RIGHT. Keep pressing the button, until the green LED in the middle lights (the semi-automatic function in manual mode may manifest itself now). If you keep pressing the button until the system stops and the green LED 14 lights, you have reached the correct point. If the LED in the middle does not light, it could be that the cylinders have reached their maximum stroke. The jacks always operate with two at the same time.
- If necessary, repeat steps 2 to 5. Then switch off the system (no. 5).
- Walk around the vehicle to see whether all jacks are properly reaching the fl oor.

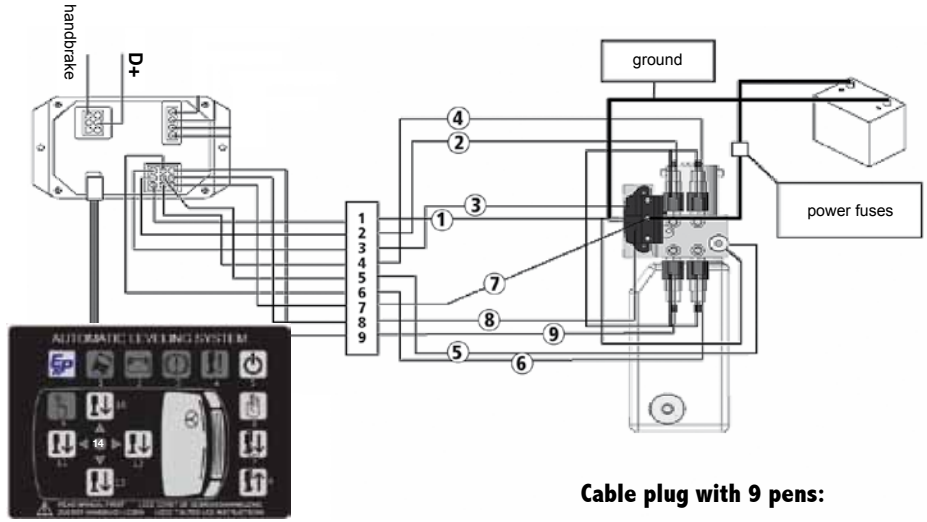
!! Warning: Never lift all wheels fully from the fl oor. If the wheels no longer have contact with the surface, there will be a risk of injuries or serious accidents.

Retracting the jacks

Tip: if, halfway through the procedure, you want to cancel the retraction immediately, switch the system off (button no. 5) and on again (also by means of button no. 5).

- Switch on the system (button no. 5). The message ON/OFF lights.
- Press the button RETRACT ALL JACKS (no. 8). If in manual mode, the jacks are only retracted as long as the button RETRACT is pressed. In automatic mode, you only have to press button RETRACT once. When all jacks have been fully retracted, the LED JACKS DOWN (no. 4) will go out.
- Switch off the system by means of the ON/OFF switch (no. 5) on the switch panel. After a short inspection around the camper, to check if the jacks are fully retracted, you can drive off.

Wiring



Cable plug with 9 pens:

1. Brown (ground)
2. Dark red (valve front right)
3. Grey (pump extend)
4. Green (valve front left)
5. Yellow (float switch)
6. Blue (valve rear left)
7. White (drive undercarriage)
8. Black (pump retract)
9. Red (valve rear right)

Special features / Tips

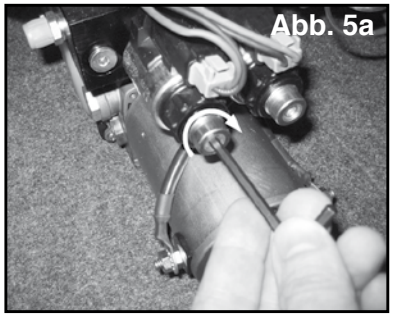
- After 4 minutes of no operation, the system will switch off automatically.
- The automatic levelling cycle can only be started after all jacks have been retracted. If the jacks are not retracted when the automatic cycle starts, the system will do this automatically. So it is not possible to make short adjustments to the jacks; the system will always first completely retract its jacks.
- At a low battery voltage, the system will automatically switch off completely.
- Jacks are extended and you want to drive: the system will immediately give an alarm and the jacks are automatically retracted as soon as the hand brake is being disengaged. In case of vehicles with a pneumatic brake installation, this takes place when the engine is started.
- All normal functions of the system are switched off in error mode.
- Always operate the cylinders 2 at a time at 1 side; when retracting, operate all 4 at the same time. Only in case of short adjustments afterwards, briefly operate all 4 cylinders separately.
- Swivel chairs: some campers have swivel chairs that do not function when the hand brake is engaged. As soon as the levelling system is finished and the ignition contact of the car is off, you are able to disengage the hand brake. Before doing that, you must of course check if the car is in gear.
- During winter sports: put something (e.g. a piece of carpet) under the jacks to avoid sliding.
- Manual operation is mainly recommended for bad surfaces.
- In manual operation, all jacks should always be extended.
- The system cannot handle all angles, the limit values differ per camper.
- If the system makes a slope angle that is too big and no longer responds to requests for automatic levelling, we recommend bringing the camper as close as possible to the zero point in manual mode.
- You will notice that the system also has a semi-automatic function. During manual operation, 1 or 2 arrows can light near the green LED 14. In this way, the system indicates where the lowest points are at that moment. Example: first extend the rear jacks by manual operation (camper is moving). Wait a moment, then press the arrow for the front jacks. It will stop automatically when the zero point is reached.
- Another option in case of a slope angle that is too high, is to drive the camper on wedges and to fill up the jacks (please do take the stability into account).

Emergency Control

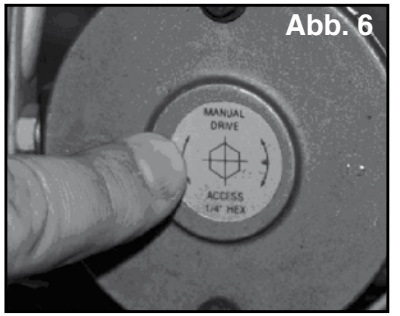
E&P's electronic levelling system can also be operated by means of auxiliary tools, such as e.g. a battery powered drill, or a battery powered screwdriver. In this way, in case of malfunctions, you can retract the jacks manually. For this you will first need the supplied socket head wrench (hexagon). First turn the four valves clockwise (see figure 5a), otherwise the emergency control will not work.

Next steps:

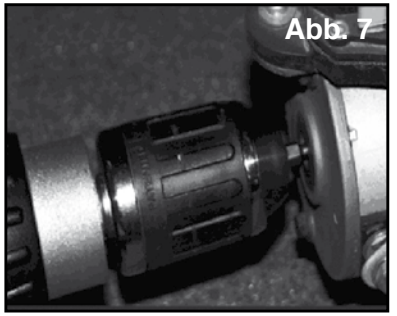
- Remove the protective label (see figure 6).
- Insert the auxiliary tool (e.g. a battery powered drill) with supplied hexagon bit in the coupling under the protective label (see figure 7).
- Let the drill run forwards or clockwise in order to extend the jacks. Backwards or anti-clockwise to retract the jacks. In this way you can still fully retract or extend the jacks manually.
- After you are finished, do not forget to turn back the valve anti-clockwise (figure 5b). This is necessary to fix the jacks on their new positions.



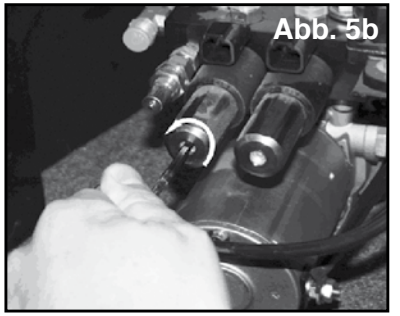
Turn clockwise in order to open the valve



Remove label in front of the emergency control



Run the drill forwards to retract the jacks



and close the valves again (anti-clockwise).

❱Troubleshooter

In case of an error message, check whether the hand brake is engaged, whether the ignition is switched on, whether the battery has sufficient voltage, whether the oil level is correct, whether there is any damage to the cylinders, and check the cables. If this does not lead to a solution for the malfunction, the malfunction could be located in the drive units. As the drive unit does not have any repairable parts, the search for malfunctions and the maintenance work to the electronics is limited to replacing the abovementioned components (also see page 63).

The error mode

- If the ignition lock is not switched on or the hand brake is not engaged, the complete unit cannot be switched on, unless the jacks have been lowered and the hand brake is being disengaged, in which case the 'park brake' led will fl ash and the buzzer will beep. You are now able to switch on the unit with the on/off button.
- If, when retracting the jacks, the pump is running on overpressure for a few seconds, the retracting action should stop (in both manual and automatic mode).
- If the jacks are retracted and the pressure switch on the pump de-energizes, the unit will retract the jacks again for a few seconds, if the ignition is switched on.
- A timer will run, which will count up when the pump is running and count down when the pump is not running. If this timer reaches a value that is too high, the pump will stop running in order to prevent overheating.
- Under normal circumstances, all LEDs are off and the unit will only respond to the 'on/off' button (switch on).

? The system does not switch on (no message on and off).

Possible causes	Solution
Ignition of vehicle is not ON.	Switch on the ignition.
Hand brake is not engaged.	Engage hand brake.
Control panel switched itself off (four minute rule).	Switch OFF and then ON (button 5).

? The led BATTERY lights, but goes out if I do not use the button for the jacks.

Possible causes	Solution
Battery almost empty.	Start camper to load battery.

!! For all other reports and/or not (well) functioning of the system, please contact your dealer!

Maintenance

The electric motor does not have any maintainable parts. If the motor does not work, it will have to be replaced. The only thing you can do is check the cables and connections.
Once the motor has been taken apart, the warranty will become invalid. The mechanical parts of the E&P Levelling System can be exchanged. Ask E&P Hydraulics for information, if you need parts.

- Check the oil level every month.
  a) Only check the oil when the jacks are fully retracted.
  b) When checking the oil level, the level should be about two to five centimetres below the filling hole.
  c) Only fill the tank when the jacks are fully retracted. If this is done with extended jacks, the oil may overspill when they are retracted again.
- The oil should be replaced every 36 months.
- Annually check the electronic connections of the drive unit.
- Regularly clean the jacks. Dirt, sand, mud and other contaminations that accumulate while driving, may limit the functionality of the system.
- If the jacks remain extended for a longer period of time, the exposed legs must be protected by weekly spraying them with a silicon lubricant. Do this every 2 or 3 days, if the camper is located in a salty environment.
- We recommend injecting the complete cylinders, including hose connections, with an anti-corrosive agent. This layer (e.g. tectyle) will protect the system against erosion and rust. This should already have been done during assembly. Annual application of anti-corrosive agent to the system will significantly increase the product's life span. Spray when the supports are retracte.
- Annual monitoring of rail tracks and damage to the piston rod.

!! Warning: Prior to all maintenance work under the camper, you must secure the front and rear axles by means of blocks. If not, there will be a risk of injuries or serious accidents.

Recommended oils

Only use transmission oil 'A' (Automatic Transmission Fluid - ATF). E&P recommends ATF with Dexron III or Mercon 5 or a mixture of both. Under freezing point, the jacks may move slower due to the viscosity of the oil. Under extremely cold weather conditions, you should use a special type of oil for low temperatures. Consult E&P Hydraulics or a recognized dealer, before using a different type of oil.

Warranty

Repairs to campers must be performed by dealers recognized by E&P Hydraulics. For systems which are not (or cannot be) changed, installed or repaired by a recognized E&P Hydraulics dealer, the warranty cannot be used.

E&P gives guarantees for parts of its Recreational Vehicle Electronic Levelling System ('Product') against faults in material and manufacturing for a period of 24 months starting from the date of purchase. If an E&P product was checked by an official E&P dealer and a fault in material or manufacturing was discovered within the aforementioned period, E&P is able to choose the following actions:

- repairing or replacing the faulty part for free in E&P's factory (or another location determined by E&P);
- sending a mechanic to the location where the product is at that moment, in order to repair or replace the product on site;
- or, writing out a credit note for the product.

All warranty claims require a product test and approval by (a dealer of) E&P. All repairs must be approved by E&P before the work starts. There can be no exceptions to this procedure. Immediately contact E&P directly before trying to perform a repair or change to your E&P product. Claims for alleged damages to products are only allowed if E&P has had the opportunity to check the claim.

The warranty will become invalid, if the buyer built items into the system, or if he made settings and in case of abuse or negligence, included but not limited to improper use, overloading, damage through accident, incorrect loading or incorrect weight distribution, damage through improper use or improper maintenance, connection to wrong parts or repair attempts by other persons than the dealer of E&P. This warranty does not apply to physical damage, damage as a result of force majeure, in case of commercial use or adaptation of the product or for products that are sold as a special offer and/or 'with defects'. This warranty will become invalid, if the product's identification criteria, which were attached in the factory, are changed or removed.